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IN THE CLAIMS

1. (Previously amended) A method of fabricating a semiconductor device, comprising the steps of:

forming a lower electrode on a substrate using a source having carbon;

subjecting the lower electrode to a pre-annealing for removing carbon remaining in the lower electrode, wherein the pre-annealing is a thermal annealing under a selected atmosphere;

forming a capacitor dielectric layer on the pre-annealed lower electrode, wherein the capacitor dielectric layer is formed of a crystalline material; and

forming an upper electrode on the capacitor dielectric layer,

wherein the lower electrode is formed of metal.

2. (Previously amended) The method of claim 1, wherein the lower electrode is formed of a material selected from the group consisting of ruthenium and platinum.

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3. (Previously canceled)

4. (Previously amended) The method of claim 1, wherein a metal organic material is used as a source of the CVD method

5. (Previously canceled)

6. (Original) The method of claim 4, wherein the pre-annealing does not substantially change the materiality of the lower electrode.

7. (Currently amended) The method of claim 1, wherein the step of forming a capacitor dielectric layer comprises:

depositing a capacitor dielectric layer on the pre-annealed lower electrode wherein the deposited capacitor dielectric layer has an actual crystallization annealing temperature that is lower than an inherent crystallization temperature of the dielectric layer; and

after depositing the capacitor dielectric on the pre-annealed lower electrode, subjecting the capacitor dielectric layer to a temperature that is lower than the inherent temperature of the dielectric layer until a crystallization annealing of the dielectric layer

occurs ~~, wherein a temperature of the crystallization annealing is lower than an inherent temperature of crystallization annealing of said capacitor dielectric layer~~.

8. (Previously amended) The method of claim 6, wherein the pre-annealing is performed at a range of between 350 ~ 750°C.

9. (Original) The method of claim 4, wherein the selected atmosphere comprises a hydrogen gas.

10. (Original) The method of claim 4, wherein the selected atmosphere comprises a nitrogen gas.

11. (Original) The method of claim 4, wherein the selected atmosphere is a mixed atmosphere.

12. (Original) The method of claim 11, wherein the mixed atmosphere comprise a hydrogen and a nitrogen gas.

13. (Previously amended) A method of fabricating a semiconductor device, comprising the steps of:

forming a lower electrode on a substrate by CVD method using a source having carbon;

subjecting the lower electrode to a pre-annealing for removing carbon remaining in the lower electrode, wherein the pre-annealing is a treatment exposing the lower electrode under a plasma atmosphere;

forming a capacitor dielectric layer on the pre-annealed lower electrode; and

forming an upper electrode on the capacitor dielectric layer,

wherein the lower electrode is formed of metal.

14. (Previously amended) The method of claim 13, wherein the lower electrode is formed of a material selected from the group consisting of ruthenium and platinum.

15. (Original) The method of claim 14, wherein a metal organic material is used as a source of the CVD method.

16. (Previously canceled)

17. (Original) The method of claim 15, wherein the pre-annealing does not substantially change the materiality of the lower electrode.

18. (Currently amended) The method of claim 13, wherein the step of forming a capacitor dielectric layer comprises:

depositing a capacitor dielectric layer on the pre-annealed lower electrode wherein the deposited capacitor dielectric layer has an actual crystallization annealing temperature that is lower than an inherent crystallization temperature of the dielectric layer; and

after depositing the capacitor dielectric on the pre-annealed lower electrode, subjecting the capacitor dielectric layer to a temperature that is lower than the inherent temperature of the dielectric layer until a crystallization annealing of the dielectric layer occurs ~~, wherein a temperature of the crystallization annealing is lower than an inherent temperature of crystallization annealing of said capacitor dielectric layer~~.

19. (Original) The method of claim 15, wherein the plasma atmosphere comprises a hydrogen gas.

20. (Currently amended) A method of fabricating a semiconductor device, comprising the steps of:

forming a lower electrode on a substrate by a CVD method using a source having carbon;

subjecting the lower electrode to a pre-annealing ~~form~~ removing carbon remaining in the lower electrode, wherein the pre-annealing is a treatment exposing the lower electrode under plasma atmosphere;

depositing a tantalum oxide layer on the pre-annealed lower electrode;

crystallizing the tantalum oxide layer at a crystallizing temperature; and

forming an upper electrode on the capacitor dielectric layer,

wherein the lower electrode is formed of metal, the pre-annealing is performed at a range of between 350 ~ 750°C, and the materiality and surface ~~form~~ morphology of the lower electrode does not substantially change ~~be~~ by the pre-annealing.

21. (Currently canceled)

22. (Previously canceled)

23. (Previously canceled)

24. (Currently amended) The method of claim 20 ~~21~~, wherein a temperature of the crystallization annealing is lower than the inherent temperature of crystallization of said capacitor dielectric layer.

25. (Currently amended) The method of claim 24, wherein the inherent crystallizing temperature of the tantalum oxide layer is ~~over~~ 700°C and the crystallizing temperature of the tantalum oxide layer is about 650°C.

26. (Currently amended) The method of claim 20 ~~21~~, wherein the selected atmosphere comprises a hydrogen gas and the thermal annealing is performed at about 450°C.

27. (Currently amended) The method of claim 20 ~~21~~, wherein the selected atmosphere comprises a nitrogen gas and the thermal annealing is performed at about 700°C.

28. (Currently amended) The method of claim 20 ~~21~~, wherein the selected atmosphere is a mixed atmosphere including about 90% of nitrogen and about 10% of hydrogen by volume.

29. (Original) The method of claim 28, wherein the thermal annealing is performed at about 450°C.

30. (Previously added) The method of claim 8, wherein the pre-annealing is performed at about 450°C.

31. (Previously added and amended) The method of claim 17, wherein the pre-annealing is performed at a range of between 350 ~ 750°C.

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32. (Previously added) The method of claim 31, wherein the pre-annealing is performed at about 450°C.